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ABSTRACT

A central problem in teacher education is the lack of curriculum integration in both competency-based and traditional teacher preparation programs. Curriculum integration is achieved when students are able to perceive a meaningful relationship between what they have learned in the different educational experiences in the program, and between those learnings and their subsequent performance as classroom teachers. These two relationships suggest two dimensions of curriculum integration: (1) integrating instructional experiences; and (2) integrating instructional objectives. Instructional experiences can be integrated in two ways--horizontally and longitudinally. A horizontal integration can be achieved by organizing the courses and the activities around unifying threads that provide a basis for the students to perceive relationships. A longitudinal integration can be achieved by designing the experiences in a way that facilitates transfer of learning from an earlier experience to a new, but similar, situation. Instructional objectives are satisfactorily integrated when students are able to perceive a relationship between what they learn in a preparation program and what they do on the job as teachers. Integration of instructional objectives can be achieved through (1) utilitarian integration of instructional objectives (identifying as objectives only those behaviors that have a high likelihood of being useful in teaching) and (2) generalizable integration of objectives (designing program objectives so that they can be widely applied in classroom teaching). (MM)

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Curriculum Integration: The Central Problem In Teacher Education

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Introduction

The central problem in teacher education is the lack of curriculum integration provided in teacher preparation programs. Programs usually consist of such a mystifying mosaic of separated courses and unrelated activities that they have, from the perspective of students, little unity either with other courses and activities or with subsequent performance on the job. When a program lacks curriculum integration, teachers graduating from it usually possess neither the ability to organize knowledge and experiences in a meaningful fashion nor the desire to attempt such organization on their own. This lack of curriculum integration can occur in both competency-based programs and traditional programs.

If Broudy's[1] distinction between a *technician* -- one who follows rules and carries out routinized procedures--and a *professional*--one who uses a theoretical body of knowledge to guide practice--can be accepted, then his charge that teacher preparation programs fail to produce professionals can be accounted for thus: when the educational experiences in the program are poorly integrated, graduates of the program do not possess the integrative view of a theoretical body of knowledge that is required if that knowledge is to be used in guiding practice. Graduates are unable to operate as professionals, even though they may desire to. While the teacher educators responsible for the program may intend to produce professionals, a program lacking integration will actually prepare poorly trained, rule-following, white-collar technicians.

Curricular integration is achieved when students are able to perceive a meaningful relationship between what they have learned in the different educational experiences provided in the program, and between those learnings and their subsequent performance as a classroom teacher. These two relationships suggest two dimensions of curricular integration. The dimension of enabling students to perceive a meaningful relationship between learnings acquired in the different educational experiences provided in the program will be referred to as *integrating instructional experiences*. The dimension of enabling students to perceive a meaningful relationship between learnings acquired in the program and subsequent performance as a classroom teacher will be referred as *integrating instructional objectives*.

When *instructional experiences* are integrated, students are able to perceive a meaningful relationship between what they learn in parts of the program. They are able to relate what they learn in a course such as educational psychology to that which they learn in a methods of teaching science course. Further, they are able to relate those learnings to the learnings occurring in practice teaching.

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[1]Harry Broudy, "The Professional Teacher: A Mischievous Illusion," The Real World of the Public Schools, New York: Harcourt Brace Jovanovich, Inc., 1972.

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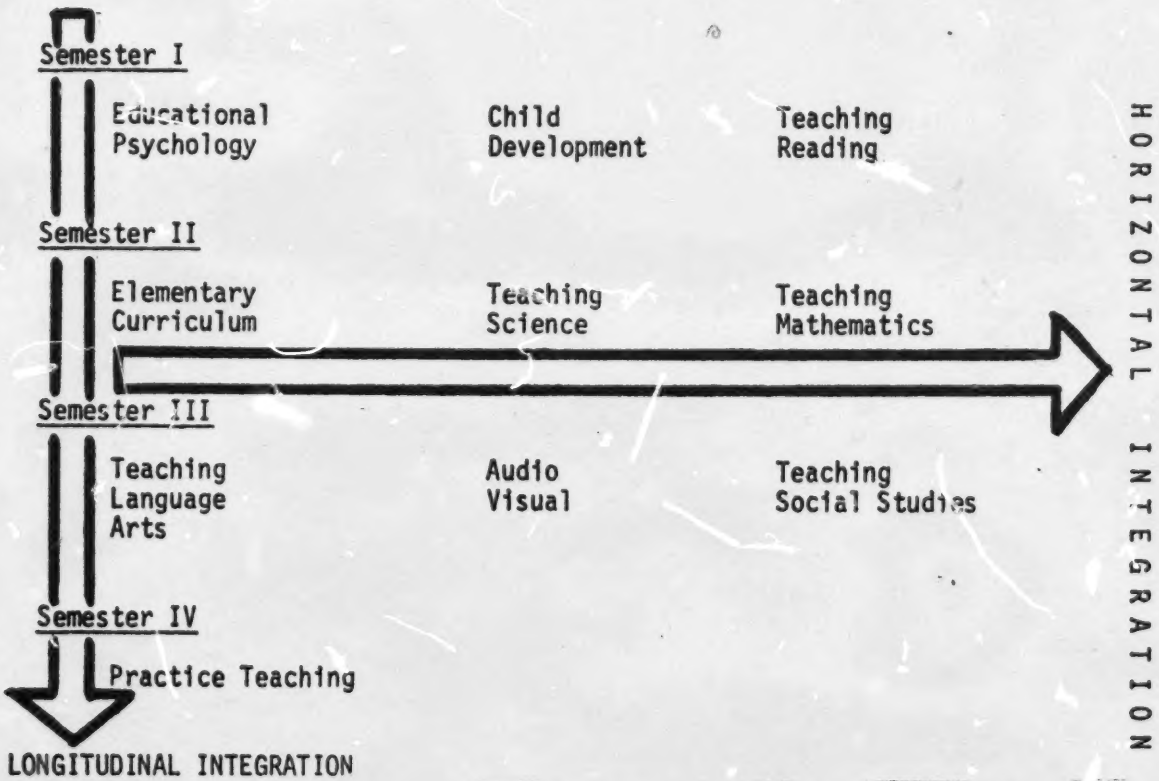
When *instructional objectives* are integrated, the learnings students acquire in the teacher preparation program are used later in teaching. For example, learning to name four reading authorities has less functional value to a teacher, and is therefore a less well integrated instructional objective, than learning to design and carry out an informal reading inventory.

Integrating Instructional Experiences

Instructional experiences in a teacher preparation program can be integrated in two ways, horizontally and longitudinally. *Horizontal integration of experiences* refers to enabling students to perceive a meaningful relationship between learnings acquired in the courses they are taking at any one time. A group of students might be taking five education courses in one semester: educational psychology, child development, elementary curriculum, methods of teaching social studies, and methods of teaching mathematics. The more closely these courses are integrated horizontally, the greater the likelihood that students will perceive a meaningful relationship between what they are learning in the separate courses. *Longitudinal integration of experiences* refers to enabling students to perceive a meaningful relationship between learnings acquired at any one time in a program and those acquired earlier or later. The more closely the five education courses are integrated longitudinally with other experiences in the program, the greater the likelihood that the learnings acquired in them are reinforced and expanded on by what is learned in subsequent semesters in other education courses, in observations of actual classrooms and in practice teaching.

INTEGRATION OF INSTRUCTIONAL EXPERIENCES



Horizontal Integration of Experiences

The conditions responsible for a lack of horizontal integration can be illustrated by examining the typical organization of instructional experiences in education courses. Published textbooks will be used for purposes of illustration, because they are a component of education courses that can be examined, and their organization probably exemplifies the organization of instructional experiences in the course. The texts selected for examination here are considered representative of books in an area. The tables of contents from four education texts are shown, two for foundation courses and two for methodological courses. As you read the topics you might try to identify the meaningful relationships between the topics that a student taking the four courses would be likely to perceive.

FOUR TABLES OF CONTENTS

Foundational Courses

Educational Psychology[2]

1. The scope of Educational Psychology
2. Educational Objectives and Human Abilities
3. Learning Processes and Theories
4. Pupil Characteristics and Learning
5. Teacher Characteristics and Pupil Learning
6. Classroom Interactions and Learning
7. Factual Information and Concepts
8. Problem Solving and Creativity
9. Psychomotor Abilities and Skills
10. Attitudes and Values
11. Personality Integration and Character
12. Motivation
13. Retention and Transfer
14. Providing for Individual Difference
15. Instructional Media and Organization
16. Standardized Tests
17. Teacher Evaluation Procedures
18. Statistics and Research Design

Child Development[3]

1. Introduction
2. Genetic Determinants
3. Environment and Intelligence
4. Nature of Intelligency
5. Learning
6. Motivation
7. Behavioral Stability in Childhood
8. Passivity-Dependency and Aggression
9. Achievement, Sexuality, and Anxiety
10. Infancy
11. Early Childhood
12. Parent-Child Interactions
13. Dimensions of Childrearing
14. The School
15. Peer Influences
16. Morality and Parental Responsibility

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[2]Klausmeir, Herbert and William Goodwin, Learning and Human Abilities (2nd Ed.) New York: Harper & Row Publishing Co., 1968.

[3]Longstreet, Langdon E., Psychological Development of the Child, New York: The Ronald Press, 1968.

Methods Courses

Teaching Mathematics[4]

1. "Change is the Law of Life"
2. The Changing Mathematics Program of the Elementary School
3. Principles of Teaching and Learning Mathematics
4. Sets and Sentences
5. Characteristics of Numeration Systems
6. Number Systems and Their Properties
7. Mathematics and the Kindergarten and Primary Grades
8. Patterns for Teaching the Basic Facts in Addition and Subtraction
9. Addition and Subtraction of Whole Numbers
10. Patterns for Teaching the Basic Facts in Multiplication and Division
11. Multiplication and Division of Whole Numbers
12. Primes, Composites, and Integers
13. Addition and Subtraction of Rational Numbers
14. Multiplication and Division of Rational Numbers
15. Rational Numbers Expressed as Decimals
16. Ratios and Per Cents
17. Mathematical Sentences and Problem Solving
18. Nonmetric Geometry
19. Measurement and Metric Geometry
20. Equipment for the Mathematics Classroom
21. Appraising Outcomes of Elementary Mathematics
22. The Diagnosis and Treatment of Learning Difficulties in Mathematics
23. Mathematics for Slow Learners
24. Enriching and Expanding the Mathematics Program for Superior Learners

Teaching Social Studies[5]

1. Definitions, Objectives, Trends
2. Foundations of the Social Studies
3. Child Development, Thinking Processes, and Learning
4. The Disciplinary Foundations
5. Structure of the Social Studies Program
6. Current Affairs and Special Events
7. Planning Units of Instruction
8. Group Inquiry and Related Skills
9. Independent Inquiry and Related Skills
10. Instructional Media
11. Community Resources and Audio-Visual Materials
12. Reading Materials, Reading Skills
13. Graphic Materials
14. Maps and Globes
15. Making Maps
16. Expressive Experiences
17. Evaluation

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[4]Grossnickle, Foster, Leo Bruekner, and John Reckzeh, Discovering Meanings in School Mathematics (5th Ed.) New York: Holt, Rinehart and Winston, 1968.

[5]Michaelis, John, Social Studies for Children in a Democracy (4th Ed.) Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1968.

Most teacher educators will probably find it difficult to identify meaningful relationships between the topics in the four tables of contents. And if teacher educators cannot clearly perceive meaningful relationships, how can they reasonably expect their students to? Yet when students are unable to perceive meaningful relationships they are not likely to develop from these courses the integrative view of a body of knowledge and experiences that is required if they are to become competent as decision makers. Lacking this integrative view they will become, by default, competent only as rule followers. These four courses will not prepare students to be competent decision makers unless they are integrated horizontally.

Horizontal integration can be achieved by organizing instructional experiences around certain identified unifying "threads." The threads--in the form of ideas, concepts principles, skills, and values--should run through all courses and activities that occur at any one time in the program. The threads provide continuity through repetition and sequence through reconsideration requiring greater range and depth of understanding. By the time students are graduated from the teacher preparation program, the unifying threads will have become the theoretical model that enables them to operate as competent decision makers.

Two perplexing problems must be solved in order to achieve horizontal integration. First, the faculty must agree on the generic ideas, concepts, principles, skills, and values that will be used as the unifying threads for all the instructional experiences provided in the program. The difficulty that teacher educators can expect to encounter in seeking such an agreement is eloquently described by Broudy.[6]

> There is no set of ideas about anything in education that the professional teacher or teacher of teachers feels obligated to learn or to consider. Members of coteries cite each other's works, but not the works of other coteries. Research is rarely replicated. Each graduate student is encouraged to produce something new, with the result that we have mountains of research studies, but no basic literature. This is one reason for "newness" being so widely used as a criterion by funding agencies. A practice is good if nobody can recall its being done before, and a benign neglect of history assures us of never-ending originality.

A faculty attempting to agree on unifying threads might wish to examine the work done on identifying learning conditons that are content free and applicable across a range of tasks. Gagne,[7] for example, identified a taxonomy of learning conditions for eight types of learning that are arranged hierarchically from the most simple to the most complex. And the psychological literature provides empirical support for learning conditions, such as motivation, arranging sequential steps from simple to complex, feedback, transfer of training, and reinforcement. The important thing is that the total faculty agree on the particular learning conditions that will be used as the unifying threads in their preparation program.

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[6]Broudy, op. cit. p. 147.

[7]Robert Gagne, The Conditions of Learning (2nd Ed.) New York: Holt, Rinehart and Winston, Inc., 1970.

A second problem that must be solved in achieving horizontal integration is relating the unifying threads to the content customarily presented in separate courses: child development, methods of teaching reading, methods of teaching social science, etc. The second problem may be more difficult to solve than the first because of the specialist orientation we typically follow. We seem to behave as if we were intending to prepare child development specialists, reading specialists, social studies specialists, and so on, rather than generalist elementary teachers.

A faculty attempting to achieve horizontal integration mush have such a firm committment to achieving program integration that they feel an overriding compulsion to break out of their compartmentalized "speciality" shells. They must feel so compulsive about integration that they are willing to approach their speciality area from the point of view of the unifying threads. For example, Gagne's concept learning would be approached from a developmental perspective in child development, and as a type of learning that calls for certain instructional strategies in methods of teaching mathematics.

Longitudinal Integration of Experiences

When a program is integrated longitudinally, the learnings that students acquire in educational psychology are reinforced and expanded upon by the learnings acquired the following semester in methods of teaching reading and the following year in practice teaching.

The conditions responsible for a lack of longitudinal integration can be illustrated by examining the hypothetical situation of a student practice teaching in a third grade. The student has been assigned to teach his first social studies lesson. The class is doing a unit on "People Who Make Our Homes," and the student's lesson is to be on "Homes Around the World." The social studies text used in the class is Working Together.[8] The Teacher's Guide accompanying the text lists three understandings for the study of "People Who Make Our Homes," one of which is

> Homes are different in different parts of the world because the climates and the available materials for building are different.

The guide also provides about one-half page of specific directions that suggest how the lesson might be carried out, such as this:

> Page 35. Study the Picture. Ask why the people wear so few clothes and why the home is made as it is. (Materials of the forest are used for the home. This roof allows the rain to run off.)

This is not the first instructional experience our hypothetical student has had that pertained to the teaching of understanding in social studies. Last semester in methods of teaching social studies he learned such things as this about teaching concepts:

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[8]Alta McIntire and Wilhelmina Hill, Working Together, Chicago: Follett Publishing Company, 1962, Teacher's Guide, TG-24.

> In each unit, children need opportunities not only to develop new concepts, but to enrich and extend concepts they already have....An effective approach to concept building is to consider the specific experiences in a unit of work and to determine the concepts that are most significant.[9]

Two semesters ago in educational psychology he learned a six-step strategy for teaching generalizations:

1. Emphasize the attributes of the concept.
2. Establish the correct language for the concept.
3. Provide for proper sequencing of instances.
4. Encourage and guide student discovery.
5. Provide for application of the concept.
6. Encourage independent evaluation.[10]

If the student's teacher preparation program is well integrated, the learning acquired in the courses in social-studies methods and educational psychology will be reinforced and expanded on by the experience of teaching the social studies lesson.

But if the student's preparation program is not well integrated then what he learned in his social-studies methods and educational psychology courses will not be used in teaching the social studies lesson. He will likely not even perceive a meaningful relationship between what was learned previously in the two college courses and the task he presently faces of teaching the social studies lesson. Lacking that perception of a meaningful relationship, he will practice behaving like a rule follower; he will follow the explicit directions provided in the teacher's guide. He will not practice behaving like a decision maker who arranges learning conditions on the basis of a theoretical model of learning, such as the theory presented earlier in the courses on social studies methods and educational psychology.

Two problems must be solved in order to achieve longitudinal integration between the two courses (educational psychology and social studies methods) and the activity of practice teaching. First, courses and activity must have an identified unifying thread running through them. Our hypothetical student is probably unaware that the term "generalizations" used in educational psychology and the term "concepts" used in social studies methods and the term "understandings" used in the teacher's guide are actually different names for the same type of learning, "conceptual attainment." Lacking this awareness, when he designs and conducts the social studies lesson, he is not likely to use the theoretical model of conceptual attainment that was learned previously in educational psychology and social studies methods. Organizing preparation programs around unifying threads is just as important in achieving longitudinal integration as it is in achieving horizontal integration.

Second, instructional experiences must be organized in a way that facilitates transfer of learning. Transfer of learning occurs when knowledge acquired previously is applied later in a new, but similar, situation. The student evidences transfer of learning if he uses his knowledge of the six-step strategy for teaching generalizations when he designs and conducts the social studies lesson on homes around the world.

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[9]Michaelis, op. cit., p. 76

[10]Klausmeir, op. cit., p. 243.

The problem of facilitating transfer of learning in teacher preparation programs can be solved by providing for three levels of instructional experiences.

Knowledge Acquisition

Students learn to verbalize knowledge (ideas, concepts, principles, skills, and values) through activities utilizing books, lectures, discussions, films, materials, classroom observations, television, etc.

Knowledge Practice

Students practice using their knowledge in simulated settings where they write exercises and lesson plans and do role plays and similar activities.

Skill Practice

Students practice using their knowledge in actual classroom settings with children. They may teach one child, a group of three or five, or an entire classroom. Their teaching is designed, conducted, and evaluated in terms of an identified area of knowledge.

Transfer of learning could be achieved with our hypothetical student by organizing the three levels of instructional experiences somewhat as follows:

Knowledge Acquisition

The student reads and hears explanations of the six-step strategy for teaching generalizations. He views televised or filmed demonstrations of teachers using the strategy in teaching social studies to children. He might even visit actual classrooms. The demonstrations, whether viewed first-hand or via television, would be discussed in terms of how the teacher applied the six-step strategy.

Knowledge Practice

The student stimulates the application of the six-step strategy for teaching generalizations. He writes lesson plans that describe how he would conduct a lesson for a specific understanding that is different from any he has seen or talked about earlier. (For example, if he has already observed a teacher doing a lesson for the understanding of why homes are different in different parts of the world, then he would write a lesson plan for another understanding; such as, "Modern machines are used on farms, and in elevators, mills, and bakeries.") He might simulate the conduct of the lesson in a role play with other students. The lesson plan and role play would be discussed by a college instructor in terms of how adequately the six-step strategy was applied.

Skill Practice

The student applies with actual children the six-step strategy for teaching generalizations. He might carry out the lesson he has planned with one child, a small group of children, or an entire class. A college instructor would observe the lesson, and when it was over would

discuss it in terms of how adequately it applied the six-step strategy. The lesson would probably be discussed in terms of more than one item of previously acquired knowledge; such as, classroom management and motivation.

Conclusion: Integrating Instructional Experiences

Instructional experiences are satisfactorily integrated when students are able to perceive a meaningful relationship between what they learn in the courses and activities provided in a teacher preparation program. Note that the emphasis is on the *students'* perceptions, not that of teacher educators. If students do not perceive a meaningful relationship then they will not develop the integrative view of learning theory that is necessary if they are to be competent decision makers who use theory in arranging learning conditions appropriate for each individual pupil.

A satisfactory integration of instructional experiences in a teacher preparation program can be achieved by attending to two factors. A horizontal integration of instructional experiences can be achieved by organizing the courses and activities in the program around unifying threads that provide students a basis for perceiving a meaningful relationship between them. A longitudinal integration of instructional experiences can be achieved by designing the experiences in a way that facilitates transfer of learning, so that students perceive a meaningful relationship between the theory of learning and the practice of it.

Instructional Objectives in Teacher Education

The second major topic of this paper, "Integrating Instructional Objectives," will be clearer if some time is taken at this point to discuss objectives. This section will deal with the value of objectives in teacher education and will define two types of objectives, knowledge and skill.

Value of Objectives in Teacher Education

Instructional objectives, to paraphrase Mark Twain, are something that teacher educators often talk about but all too seldom do anything about. For as long as most can remember, students in education courses have learned to write lesson plans having three major sections: objectives, procedures, and evaluation. But not until the advent of educational technology did many teacher educators begin to realize that quite often they were not distinguishing between objectives and procedures; what they were calling objectives were actually procedures.

Objectives and procedures, as teacher educators use the terms, usually refer to instruction, and so might more clearly be called *instructional objectives* and *instructional procedures*. Instructional objectives describe behaviors that students will be expected to exhibit as a result of instruction. Instructional procedures are the means for achieving the student behavior described in the objective. In this context, instructional evaluation is used to determine if the student is able to exhibit the behavior described in the objective.

In this context, instructional evaluation is used to determine if the student is able to exhibit the behavior described in the objective.

Mager[11] provides examples of correctly stated objectives and procedures (meaning instructional objectives and procedures):

> Objective Statement
> To be able to explain the principles for developing reading readiness in the primary grade.
>
> Procedural Statement (Mager calls them Course Descriptions)
> Discuss principles, techniques, and procedures in developing; reading readiness in the primary grades.

Notice that Mager's objective describes the behavior that students are expected to exhibit as a result of instruction: they should be able to give an adequate explanation of a certain set of principles. Mager's procedure describes the means the teacher educator will use in enabling students to exhibit the behavior identified in the objective.

The major reason for being concerned about objectives in teacher preparation is that this encourages teacher educators to focus on students rather than on themselves. When instruction is related to a correctly stated objective, the purpose of the procedures becomes to enable students to behave in the way described in the objective. The focus of the procedures is on the student's performance rather than on the teacher's performance. And the evaluation is also focused on student performance because it seeks to determine whether a student is able to exhibit the behavior described in the objective. The consequence of that evaluation is a yes or no decision. Yes, the student has adequately performed the behavior; instruction should now be provided for another objective. No, the student has not adequately performed the behavior; additional instruction should be provided for the same objective.

Not distinguishing between objectives and procedures results in an emphasis on what teacher educators do with their students rather than on what students do when they perform as teachers. This can be illustrated by a hypothetical lesson plan having an incorrectly stated objective. If the hypothetical lesson plan had used an authentic objective, like "To be able to explain the principles for developing reading readiness in the primary grades," then the evaluation would consist of a test of some sort that indicates whether or not a student was able to give an adequate explanation. Rather then the lesson ending when the teacher had finished the discussion, it would end only when each student was able to give an adequate explanation.

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[11]Robert Mager, Preparing Instructional Objectives, Palo Alto, California: Fearon Publishers, 1962, p. 6.

Lesson Plan With Incorrectly Stated Objective

PLAN	COMMENTS ON THE PLAN
Objective Discuss principles, techniques, and procedures in developing reading readiness in the primary grades.	This is not an objective. It is a procedure because it tells how the teacher will conduct instruction.
Procedure Three procedures for reading readiness will be listed on the board. Students will be asked to suggest techniques and procedures that follow from the principles.	This amplifies on the procedures the teacher will use.
Evaluation Did students discuss the topic?	This asks if the teacher used the procedure; it does not determine what the student is able to do as a result of the discussion. It is not possible to evaluate the lesson in terms of student performance, because the objective did not define student performance.

Types of Objectives

Objectives in the area of teacher preparation are of two types, knowledge and skill. Knowledge objectives describe students' verbal responses. Mager's objective of having the student "be able to explain the principles..." is a knowledge objective because it refers to a verbal response. Another knowledge objective is to "be able to define the criteria for the three functional reading levels."

Skill objectives describe job-related task responses, actions that people perform as teachers. A skill objective related to the previous knowledge objective is to "be able to administer an informal inventory to a child." A related skill objective is to "be able to design an informal reading inventory." Notice that knowledge objectives have students talk about the teaching job while skill objectives have them actually do the job.

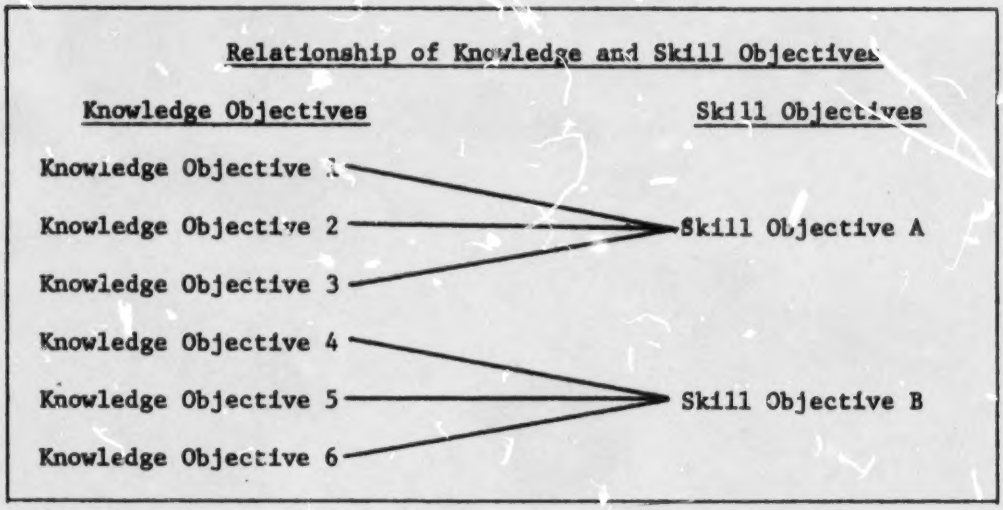
Knowledge objectives are assumed to facilitate the attainment of skill objectives; thus, having students learn criteria for the three functional reading levels is assumed to be necessary if they are to learn to administer an informal reading inventory.

The definitions provided in this section will be followed in the remainder of this paper. Briefly, those definitions are

Objective
Describes expected student behavior.

Knowledge Objective
Describes a verbal response.

Skill Objectives
Describes a job-related task response.

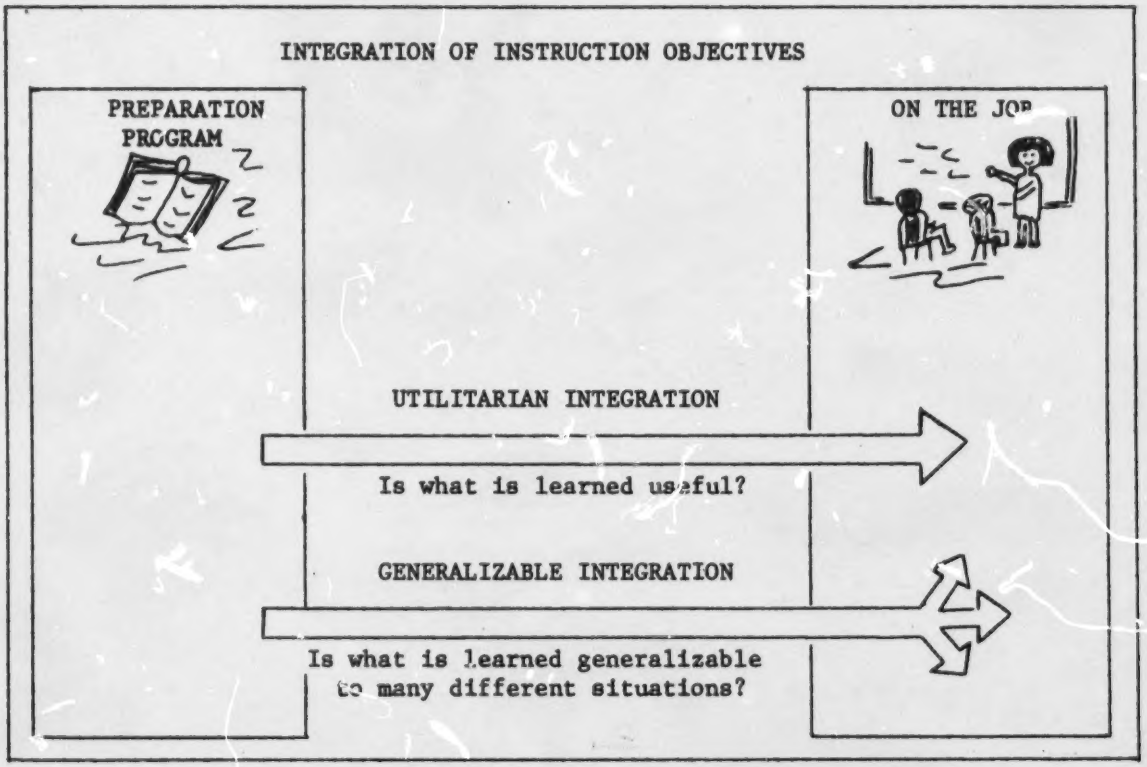


Integrating Instructional Objectives

Instructional objectives can be integrated in two ways, utility and generalizibility. *Utilitarian integration of objectives* refers to having students learn that which has a high likelihood of being useful in teaching. It is illustrated by an example given earlier, where learning the names of four reading authorities was contrasted with learning to design and conduct an informal reading inventory; learning about the informal reading inventory is the more utilitarian objective because there is greater likelihood that it will be used in teaching. *Generalizable integration of objectives* refers to having students learn that which has a wide applicability in classroom teaching. For example, learning a single principle for designing independent activities that help children think creatively is a more generalizable objective than learning the 20 specific independent activities for creative thinking given in a textbook. When students have learned the principle, they can design their own independent activities, and the activities designed will be suitable for whatever aged-children and subject content the teacher wishes. By contrast, after learning the twenty specific activities all students can do is carry them out with the aged-children and subjects for which they were originally designed by the textbook author; students often facetitiously refer to learning with a limited generalizability as "cookbook recipes."

Utilitarian Integration of Objectives

The major problem in achieving a utilitarian integration of objectives is distinguishing between learnings that are suitable for general education and those that are peculiar to teacher preparation. When this distinction is not made, the tendency in teacher preparation is to have students learn content (general education) rather than how to teach the content (teacher preparation). An emphasis on content rather than on the teaching of it is exemplified by a



text used in mathematics methods courses, Discovering Meanings In Elementary School Mathematics.[12] A chapter dealing with measurement and metric geometry has content topics such as these:

Constructing a perpendicular to a line
Constructing an angle congruent to a given angle
Finding perimeters
Finding the area of a rectangle

Most of the chapter is devoted to telling how these tasks are carried out. Very little space is devoted to describing how to teach a child to do these tasks.

The problem of identifying objectives that are appropriate for teacher education might be solved in two steps. First, identify as skill objectives only those statements that refer to teaching actions. For example, an unsatisfactory skill objective would be "To be able to find the area of a rectangle"; that may be a mathematics skill, but it is not a teaching skill. A satisfactory skill objective would be "To be able to demonstrate the procedure for teaching a child to find the area of a rectangle."

Second, identify as knowledge objectives only those behaviors that seem to be prerequisite to attaining the skill objective. For example, a skill objective given earlier was "To be able to administer an informal reading inventory." (The statement is a satisfactory skill objective because it

[12]Grossnickle, op. cit, pp. 340-362.

identifies a teaching action, administering an informal reading inventory.) Some knowledge objectives that seem prerequisite to attaining that skill objective might be as follows:

Be able to define the three functional reading levels.
Be able to define the criteria for the three functional reading levels.
Be able to explain the sequence for and administering the informal reading inventory.

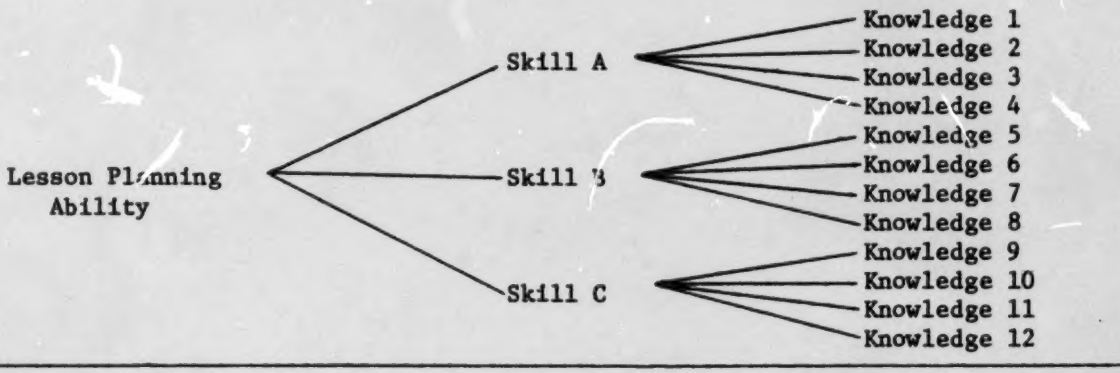
Any knowledge objectives that do not seem to be prerequisite to attaining that skill objective should be dropped. Examples of unsatisfactory knowledge objectives would be these:

Be able to describe the history of the informal reading inventory.
Be able to explain the philosophy behind the informal reading inventory.

The prerequisite relationship between knowledge and skill objectives can be tested, both logically and empirically, by asking whether a person could attain the skill objective without having previously attained the knowledge objective. For example, the objective "Be able to define the criteria for the three functional reading levels" is probably a satisfactory knowledge objective because it is logical that a person could not administer an informal reading inventory if he was unable to define the criteria. On the other hand, he could probably administer an informal reading inventory very competently even though he was unable to describe the history of the instrument.

The carrying out of the process of identifying skill objectives related to teaching actions and identifying knowledge objectives related to skill objectives can be illustrated with a teaching action that is commonly listed as a program objective, lesson planning ability.

PROCESS OF IDENTIFYING OBJECTIVES



Before ending this discussion of the utilitarian integration of objectives, it must be understood that the notion of instructional objectives presented here is not intended to include all the behaviors that a teacher might be expected to exhibit. The notion is applicable only for those behaviors that might be taught. For example, the Student Teaching Guide for Arizona State University[13] lists 22 behaviors that students are supposed to exhibit. While all the behaviors are certainly important, and many might even be learned in the program, only four are very amenable to teaching; these are underlined.

1. Appearance
2. Mental Alertness
3. Poise and Personality
4. Enthusiasm
5. Health and Energy
6. Emotional Stability
7. Tact and Judgment
8. Desire to Improve
9. Dependability
10. Professional Attitude
11. Cooperation
12. Innovativeness
13. Communication Skills*
14. Lesson Planning Ability
15. Rapport with Pupils
16. Classroom Control Skills
17. Pupil Motivational Skills
18. Teaching Skills
19. Provides for Individuals
20. Understands Pupils
21. Mastery of Subject Matter*
22. Potential as a Teacher

The four behaviors that have been underlined are actions the teacher preparation program might teach a student to perform. The other 18 behaviors are desirable characteristics and capabilities that are used as criteria in evaluating the overall desirability of a teacher, but these student behaviors are probably not much affected by the instructional experiences that have been planned into the program.

Generalizable Integration of Objectives

The generalizable integration of objectives refers to having students learn that which has a wide applicability in classrooms. Having students learn a principle for designing instruction that is suitable for teaching concepts in social studies is more generalizable than having them learn five specific activities to be used in social studies. The principle can be applied with children of any age and with any social studies unit while the five specific activities can be used only with those specific units and children for which they were originally designed.

The result of not providing students with sufficiently generalizable learnings is illustrated by the initial teaching experiences of a person who has now been teaching for about 20 years. She reported that in her first two weeks of teaching she used all that she had learned in the two years in her

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[13] College of Education, Arizona State University, Student Teaching Guide for Arizona State University. Mimeograph, 1971.

*While Communication Skills and Mastery of Subject Matter can be taught, they are not underlined because they are not suitable behaviors for a teacher preparation program. See the distinction made earlier between learnings suitable for general education and those suitable for teacher preparation).

teacher preparation program, after that she was on her own. One might presume that what she learned in her preparation program consisted mostly of highly specific lists of activities. In two years in the program she had learned enough activities to carry her through the first two weeks of teaching.

The problem of generalizable integration is illustrated by the approach taken in a text used in mathematics methods courses. In Chapter 12 of the text,[14] on "Primes, Composites, and Integers," no attempt is made to teach students principles for teaching primes, composites, and integers to pupils. The text only occasionally provides descriptions of specific activities. For example, in a discussion of signed numbers it says, "One plan of action is to place a number line on the chalkboard.. " and so on for about 360 words. Presumably, the students are supposed to memorize the plan of action, and use it the first time they teach signed numbers. If the pupils do not learn all about signed numbers with this plan of action, the teachers are on their own--like the teacher mentioned earlier.

The lack of attention to the generalizable integration of objectives can be observed in methods texts in many areas. For example, Chapter 13 of the text Principles And Practices of Teaching Reading[15] is devoted to "Developing and Expanding Concepts." One section in the chapter is entitled "Figurative Expressions." The first three paragraphs of the section are devoted to a discussion of three studies of children's learning of figurative expressions. The text then says, "The following are a few techniques which might be adapted to various instructional levels..." and then it takes the next three and one-half pages to describe specific exercises that might be used. It does not identify a principle that students might use in designing similar exercises. Presumably, when teachers want to teach figurative expressions they either must have memorized the exercises described in the text or they must turn to this section and use it as a teacher's manual. And when children have completed the exercises, the teachers are left on their own.

Interestingly enough, both the Grossnickle mathematics text and Heilman reading text devote an entire chapter to principles for teaching. Chapter 3 in the Grossnickle text is called "Principles of Teaching and Learning Mathematics" and Chapter I in the Heilman text is called "Principles of Teaching Reading." Both texts suggest what appear to be highly generalizable principles, such as these:

> Grossnickle: mathematics[16]
>
> Learning is a growth process from an immature level of dealing with numbers to an adult level of operation with them.

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[14]Grossnickle, et al. op. cit., pp. 205-221.

[15]Heilman, Arthur W. Principle and Practices of Teaching Reading (3rd Ed) Columbus, Ohio: Charles E. Merrill Publishing Co., 1972.

[16]Grossnickle, op. cit., p. 30.

Heilman: reading[17]

> Reading instruction should be thought of as an organized, systematic, growth-producing activity.

But neither text relates those principles to the teaching of reading and mathematics, with the result that neither provides students guidance in using these principles in designing and carrying out instruction in mathematics and reading.

One solution to the problem of achieving a generalizable integration of instructional objectives is to identify as skill objectives those behaviors having a wide applicability because they are related to a theoretical construct of learning and teaching. For example, Gagne[18] identifies the process of learning and teaching for eight types of learning, one of which is concept learning. He defines the learning of a concept as:

> Learning to classify stimulus situations in terms of abstracted properties like color, shape, position, number, and others. (p. 51)

He provides operational descriptions of concept learning:

> How does one know whether the child has in fact learned the concept *middle*? The crucial test is whether he will be able to respond correctly, not by chance, to some new configurations of objects he has not previously used in the course of learning. (p. 53)

And he explains how the conditions within the learner and the conditions within the situation must be attended to in order to enable a pupil to learn a certain concept.

Skill in teaching concepts is important because it has wide applicability. The Grossnickle mathematics text[19] identifies numerous "basic concepts" that pupils in the kindergarten and primary grades should learn, such as:

> Sets; the ideas of more than and less than; cardinal and ordinal numbers...numerals and number names; counting by ones and twos; the number ten; place value for numbers less than 100; inequalities; addition, equality and equations; geometric concepts of space, point, line, and geometric figures.

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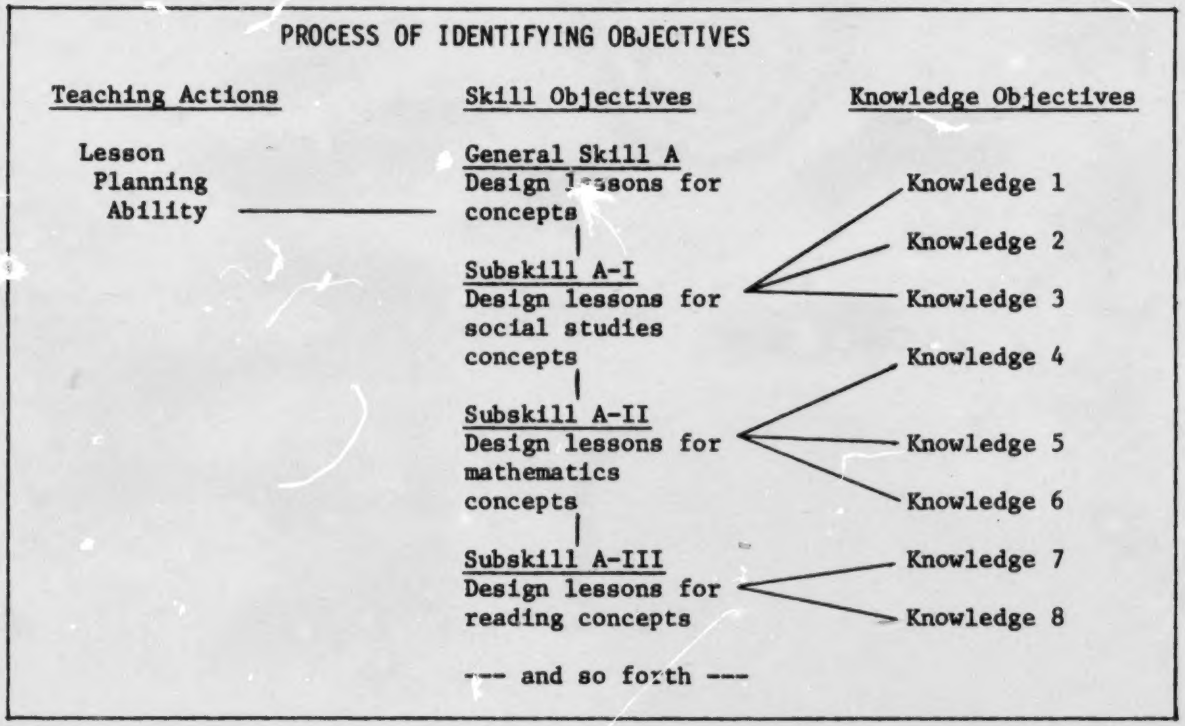
[17]Heilman, op. cit., p. 7.

[18]Gagne, op. cit.

[19]Grossnickle, op. cit., p. 93.

The Heilman text[20] devotes an entire chapter to "Developing and Expanding Concepts." The Michaelis social studies text[21] provides numerous references to teaching concepts and notes that social studies programs should be structured around concepts and generalizations.

If the theoretical construct of concept learning is related to teaching actions and then analyzed in terms of skill and knowledge objectives, the process of identifying objectives might look something like this:



Additional general skill objectives (such as General Skill A) for the same teaching action might be based on other types of learning that Gagne identifies, such as verbal association, rule learning (generalization or principle learning), and problem solving.

Conclusion: Integrating Instructional Objectives

Instructional objectives are satisfactorily integrated when students are able to perceive a meaningful relationship between what they learn in a teacher preparation program and what they do on the job as teachers. Note that it is the students who must perceive a meaningful relationship, not the teacher educator. When the students do not perceive a meaningful relationship, then they do not develop the integrative view of learning theory that is necessary if they are to be competent decision makers who use theory in arranging learning conditions appropriate for each individual pupil. If they do not develop an integrative view they will be competent only as rule followers.

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[20]Heilman op. cit., pp. 447F.

[21]Michaelis, op. cit.

A satisfactory integration of instructional objectives can be achieved by attending to two factors. A utilitarian integration of objectives is achieved by identifying as program objectives only those behaviors that have a high likelihood of being useful in teaching. A generalizable integration of objectives can be achieved by designing program objectives in such a way that they have a wide applicability in classroom teaching.

Two dimensions of curricular integration have been identified, integrating instructional objectives and integrating instructional experiences. These dimensions, and factors related to them, can be used as criteria in developing and evaluating the curricular portions of teacher preparation programs.

Four criteria are suggested.

1. *Utilitarian Integration of Instructional Objectives*

   Do the program objectives identify behaviors that have a high likelihood of being useful in teaching?

2. *Generalizable Integration of Instructional Objectives*

   Do the program objectives relate to learning constructs in such a way that they have a wide applicability in teaching?

3. *Horizontal Integration of Instructional Experiences*

   Are the courses and activities in the program organized around unifying threads?

4. *Longitudinal Integration of Instructional Experiences*

   Are the instructional experiences in the program designed in such a way that transfer of learning is facilitated?

The major challenge facing teacher educators in the remainder of the 20th Century is to make the curricular changes that are necessary if they are to be as effective as they can and must be. If teacher educators are not able to make the necessary curriculum changes, then teacher preparation will continue in the mischievous illusion that it prepares professionals, while in actuality it prepares poorly trained, rule-following technicians. The major change that must be made is achieving a level of curricular integration that enables teachers to use knowledge in guiding practice, and so operate as the professionals they desire to be.